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What's Raining On Solar's Parade

Almost all solar panels are made with silicon -- and makers can't buy enough of it

Sometimes it's possible to be a little too successful. The solar power industry has been on a tear, growing at more than 30% per year for the last six years. It's poised to reach a surprising milestone within two years, when it will gobble up more silicon for its electricity-generating panels than semiconductor makers use in all their chips and devices. The onetime "'tree-hugger' industry is not a niche business anymore," says Lisa Frantzis, director of renewable energy at Navigant Consulting Inc. (**NCI**).

So what's the problem? "Global demand is stronger than the existing supply," says Lee Edwards, president and CEO of BP Solar (**BP**). His company and others can't buy enough of the ultrapure polysilicon now used in 91% of solar panels. The raw material shortage has slashed growth for the industry from more than 50% in 2004 to a projected 5% in 2006.

The shortage has caused prices for polysilicon to more than double over the last two years. As Economics 101 teaches, that should prompt producers to expand capacity. But for suppliers such as Michigan-based Hemlock Semiconductor Corp., the world's largest producer, the decision hasn't been easy. For one thing, the company was badly burned in 1998. It had just built a new facility in response to pleas from semiconductor makers when Asia went into a slowdown. Demand for silicon plunged, and the factory had to be shuttered. Now the U.S., Germany, and other nations are offering subsidies for solar power -- but governments can take away incentives as easily as they put them in place. "We did a lot of soul-searching," says Hemlock President and CEO Donald E. Pfuehler. "Would the incentives go away? Is the solar industry real or just a flash in the pan?"

Hemlock finally decided that the industry is real, but only after solar companies agreed to share the risk by signing contracts to buy the future output. So in December the company began an expansion worth more than $400 million that will increase silicon production by 50%. Competitors are following suit. On Jan. 12, Munich-based Wacker started construction on a silicon manufacturing plant. The new supply, however, won't be onstream until 2008.

A JOLT FROM SUBSIDIES

In the meantime, companies are scrambling to cope with the shortage. Sharp Corp., the world's top producer of solar panels, and BP Solar are making panels thinner to use less silicon. First Solar LLC in Phoenix and others are ramping up nonsilicon technologies. "This is a perfect sector for innovation and new players," says BP's Edwards.

One factor driving demand is Germany's scheme of paying big bucks (more than 55 cents per kilowatt hour) for power from anyone with solar panels. That "lucrative program caught us all by surprise and gave a lot of push," says Pfuehler. Spain and Italy have jumped in with similar plans. In the U.S., last year's energy bill included solar subsidies, and "governors are going nuts on renewables," says Scott Sklar, president of the Stella Group Ltd., a green power consultancy. "The funny thing," he adds, "is that Republican governors, like California's Arnold Schwarzenegger and New York's George Pataki, sound crazier than Al Gore on this." The most ambitious plan: On Jan. 12, the California Public Utilities Commission earmarked $2.9 billion over 10 years for solar power.

For many nations, solar offers a hedge against spikes in prices of fossil fuel. In Japan, even without incentives, higher fuel prices and other costs have made solar electricity almost cost-competitive. And huge potential markets, such as China, are just beginning to be tapped.

That's why analysts predict the growth will surge when the new polysilicon production lines get going. And the boom should continue for at least 10 years. By then, technological improvements, economies of scale, and competition from new entrants such as China may make sun power cost-effective without government help. "Prices are going down every year, and the cost of standard electricity is going up," explains Ron Kenedi, Sharp's vice-president for solar energy solutions. "There will be a meeting point." When that happens, the industry may finally see growth without growing pains.